vious reports had also been overcome through some concrete remedial actions.

(d) Keeping in view the success of the programme, Government of India has urged upon UNDP for approval of the proposal for the next phase of the TOKTEN Programme on overriding priority.

Study on Ozont depletion

8304. SHRI SUSHIL KUMAR SAMBHAJIRAO SHINDE: Will the PRIME MINISTER be pleased to state:

(a) whether the National Physical Laboratory, New Delhi, has conducted a study about the extent of depletion Ozone in the atmosphere and its effects on the globe in general and the tropicals and semitropical countries, particularly India;

(b) if so, the details thereof; and

(c) the steps already taken and being taken to minimise the adverse impact of depletion of Ozone layer in the light of the study?

THE MINISTER OF STATE IN THE PRIME MINISTER'S OFFICE AND MINISTER OF STATE IN THE DEPARTMENTS OF ATOMIC ENERGY AND SPACE AND MINISTER OF STATE IN THE MINISTRY OF SCIENCE AND TECHNOLOGY (SHRI BHUVNESH CHATURVEDI): (a) Yes, Sir.

(b) The study of ozone at NPL using Nimbus satellite measurefents indicates a world-wide decrease in total ozone from 1979 to 1989. There is a marginal decrease in total atmospheric ozone content over Indian latitudes. At latitudes higher than 45 degree ozone depletion has been certainly detected. Polar regions, in particular, the Antarctica, where the ozone hole was discovered, are well established as locations of ozone destruction.

(c) The ozone depletion is caused by various ozone depleting substances like Chioro-Flouro Caroons, Halons, etc. As signatory to the Montreal Protocol, the Government of India has prepared a country programme to phase out all these ozone depleting substances as per the stipulations of the Protocol and actions are being taken as per the action plan mentioned in our country report by the Ministry of Environment and Forests as nodal agency. It is an integrated approach which takes care of all the national and international interests.

Technologies Developed by ISRO

8305. SHRI G. Y. KRISHNAN: Will the PRIME MINISTER be pleased to refer to the answer to Unstarred Question 4863 given in the Rajya Sabha on 4th May, 1995 and state:

(a) the details of 224 technologies developed and transferred by Indian Space Research Organisation to Industry for commercialisation with tentative project cost, group-wise;

(b) the names of the eight products which require buy-back from ISRO, their annual requirements and value; and

(c) whether ISRO is having MOU with industry for buy-back of products referred in part (a) above; If so, what are the details thereof, product-wise?

THE MINISTER OF STATE IN THE PRIME MINISTER'S OFFICE AND MINISTER OF STATE IN THE DEPARTMENTS OF ATOMIC ENERGY AND SPACE AND MINISTER OF STATE IN THE MINISTRY OF SCIENCE AND TECHNOLOGY (SHRI BHUVNAESH CHATURVEDI): (a) The details of 224 technologies developed by Indian Space

Research Organisation are in statement-I . (*See* below) Regarding project costs, these have borne by the industries and these have borne by the industries and these varied widely depending upon the nature of implementation, namely, whether the products are produced by using their existing facilities with minor modifications or in new enterprises.

(b) The eight products which requires ISRO buyback include chemicals such as Unsymmetrical Dimethyl Hydrazine (UDMH) of two different versions, Monomethyl Hydrazine, Hydroxyl Terminated Polybutadiene (HTPB) and other items such as control components, Silver Zinc Cells, Temperature resistant silica cloth and Signal Processing Unit. Their annual requirements and value are highly varied from year to year based on projects requirements.

(c) Yes, Sir. For Silica Cloth, one version of UDMH and control components, the agreement periods and supplies have already been completed. Agreements are in force in respect of Chloromine route of UDMH, Monomethyl Hydrazine, Silver Zinc cells and HTPB. The technology transfer process is underway and agreement is in force for Signal Processing Unit.

STATEMENT

Application wise technologies developed and transferred from ISRO BUY-BACK

1. Miniature Rate Gyroscope
2. Unsymmetrical Dimethyl Hydrazine (Urea route)
3. Unsymmetrical Dimethyl Hydrazine (Chloromine route)
4. Monomethyl Hydrazine
5. 1.5AH Silver zinc cells
6. Hydroxyl Terminated Polybutadiene
7. High Silica Cloth
8. Vibration Acoustic Signal Processor Unit (SPU)

SPACE-APPLICATIONS

1. S-Band Direct Reception System
2. to 5 6 GHz, 3 KW High Power Amplifier

6 to14 UHF Communication Subsystems

15. Data Collection, Storage & Transmission Systems
16. INSAT Radio Networking Terminal
17. Disaster Warning System
18. Diazo Printer
19. Large Format Optical Enlarger
20. Multiband Ground Truth Radiometer

21 to 22 Low-cost Communication Terminal

23. C-band Low Noise Amplifier
24. 4.5M GFRP Antenna
25. 4.5M GFRP Reflector
26. BSS Uplinking equipment or RN Modulator

27 to 36 Hardware for News/Fascimile/Met Data Dissemination

37. High Magnification Enlarger
38. Charge Coupled Device Camera

39 to 41 ISROVISION—System with VIBGYOR-2001 Display Processor &SACIMAGE software library

42. DRS Mk-II
43. Middle End Image Processing System
44. Geographical Information System
45. ISROVISION Mk-II
46. Frame Grabber
47. Antenna Controller
48. Audio-video combiner and separator

49. 3M dia Road Transportable/Air-liftable Antenna

50 to 52 Extended C-band Earth Station Equipment

53 to 54 SBRTN Terminal subsystems

55. C x C/S Feed Antenna

56. Multispectral Additive Color Viewer

57. Optical Reflecting Projector

58 to 60 Light table with co-ordinate measuring disk and viewing disk

61. Dual Denistometer

62. Dual Color Composite Printer

63. Analog Image Analyser

64. S-Band PM Transmitter

65. Interactive Intelligent Image Graphic Display Terminal

66. Micro-MIDAS

67. Map Master

68. Optical Pentograph

69. Photo write system

70. Drum Scanner Digitiser

71. Optical Transferoscope

72. Spectro radiometer

73. ADPCM Transcoder

74. Oven Controlled Crystal Oscillator

75. Point Light Source Contact Printer

76. Optical Polarisation Sensor

77. Precision Co-ordinate Measuring System

78. Hand Held Rationing Radiometer

79. SACIMAGE Open licence

80. 600 MHz Band Pass Filters

81. 402 MHz Low Profile Planat Antenna

82. Geographic Information System-II

83. Extended C-band Cassegrain feed

84. Transputer based image analysis system

85. CCD Camera Mk-II

86. 4.5 to 4.8 GHz LNA

87. Multifunction front-end processing hardware

88 Microwave Invar Filter

SPIN-OFFS

1. X-Y Plotter

2. Pressure Transducers

3. Thrust Transducers

4 to 5 ISRO Dry Powder

6 to 8 ISRO Polyols

9 to 27 Adhesives & Sealants

28. Dioctyl Pthalate

29. RMEU

30. Strain Gauge Accelerometer

31. Piezo-Electric Vibration Pick-up

32. Data Amplifier

33. Liquid Phenolic Resin

34. Epoxy based insulation coating

35. Pultrusion Machine

36. FEAST Software Package

37 to 38 Silset & Siltron

39. Micro ARTs

40 to 41 Dimer Acid and Polyamide

42. Pedetron-A

43 to 45 Flexible Linear Shaped Charges

46 to 47 Impact & Friction Sensitivity

48. Pedclean-A

49. Malar Wordprocessor

50. ISRO-PN-250 Adhesive formulation

51. EPY-2183 adhesive formulation

52 to 55 Ordnance Systems

56. In-situ Electro-polishing device

57. Precipitated Silica from rice husk ash

58. OLFEX Dry Powder

59. Mandrel Material

60. Vnyl Ester Resin

61. PIM-750 Polyimide

62. Polyamic Acid

63. QDAT Software

64. FEAST Single Transputer Software

65 to 77 Monochrome TV Studio Equipment

78. Quadrature Phase Shift Kaying (QPSK) Madem

79. Illuminating Magnifier

80. Automatic Microfische Camera

81. Microfische Camera

82. Vertical Dynamic Balancing Machine

83. Agrophotometer

84. Antireflection coatings (Optocoat-1)

85. Optocoat-2

86. Optocoat 3

87. Optocoat-5

88. Optocoat-6

89. Optosoft

90. Relay Parameter Tester

91. Hygrophotometer

92. Magnetometer

93. Crane Control System

94. Teflon Coating

95. Worm Driven Mechnical Jack

96. Domestic Electric Shock Protector

97. PWM Amlifier

98. 8 HP DC Servomoter

99. Air Slide

100. Low-cost Rural Windmill

101 to

103. Precision Pressure Transducers

104. Pneumatic Vibration Isolators

105. Digital Servo

106. SCR Amplifier

107. Anodising on Titanium alloys

108. Gold chrome plating on stainless steel

109. Stereo Optical transferoscope

110. Digital Browsing System

111. SCR Power Amplifier

112. Digital Signal Processor Card

113. Temperature sensors

114 Anodizing|Anodizing black dyeing on aluminium alloys

115. Optical Solar Reflector

116. Texturemeter

117. Multifunction digital demodulator & bit synchroniser

118. Multifunction Simulator

119. FM Telemetry system

120. FEAST PC version software

121
to

122. Ordinance systems (Explosive Bolt and Cable cutter)

123. EPY-3015 Adhesive formulation

124. Single component flushing system

125. Laser Range Finder

126. Auto Focus Enlarger

127. Development of Wide band ARCs for LISS-3 & WIFS Optics

128. Star Sensor